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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/589,204

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EXAMINER

NGUYEN, TU MINH

ART UNIT

PAPER NUMBER

3748

MAIL DATE

DELIVERY MODE

11/14/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/589,204

Applicant(s)

YOKOI ET AL.

Examiner

Tu M. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-17, 20, 23, 24 and 27 is/are rejected.
- 7) ☒ Claim(s) 18, 19, 21, 22, 25, 26 and 28-31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20060811, 20071024</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. An Applicant's Preliminary Amendment filed on August 11, 2006 has been entered.

Claims 1-12 have been canceled. Claims 13-31 have been added and are pending in this application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 13-16 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Harndorf et al. (PCT Publication No. WO 02/38932) (see U.S. Patent 6,948,311 for the English equivalence).**

Re claims 13 and 23, as shown in Figures 1-3, Harndorf et al. disclose a regeneration controller and a method for eliminating particulate matter accumulated in an exhaust purification apparatus (particulate filter (115b)) that is arranged in an exhaust system (110) of an internal combustion engine (100), the regeneration controller comprising:

- a heating section (step 230) for heating the exhaust purification apparatus to eliminate the particulate matter accumulated in the exhaust purification apparatus when an estimated accumulation amount is greater than a reference accumulation amount (step 210 with positive

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answer), wherein the heating section obtains the estimated accumulation amount by estimating the amount of particulate matter accumulated in the exhaust purification apparatus (see lines 1-18 of column 5); and

- a mode change section for changing exhaust purification apparatus heating modes (from a second phase to a third phase as claimed in claims 1-4) when heating the purification apparatus if the estimated accumulation amount is within a mode change range (in Harndorf et al., when a determination is made that the regeneration of the filter has just begun, a second phase where a quantity of supplied uncombusted fuel is constant, is ended, and a third phase where a quantity of uncombusted fuel is intermittently supplied, begins; wherein the determination is based on a change in the estimated accumulation amount estimated by a change in differential pressure across the filter (see at least line 43 of column 6 to line 14 of column 7), wherein:

- an exhaust having an air-fuel ratio flows the exhaust system;
 - the mode change range is set in accordance with a comparatively small estimated accumulation amount (when a determination that the regeneration of the filter has just begun (i.e., when the downstream temperature of the filter is greater than the upstream temperature or the differential pressure across the filter is reduced by a threshold value), only a small amount of particulate matter in the filter is combusted); and

- the mode change section changes the heating mode when the estimated accumulation amount is within the mode change range from a normal heating mode (second phase), for heating the exhaust purification apparatus by continuously keeping the air-fuel ratio in the exhaust system low, to a burn-up heating mode (third phase), for burning up the particulate matter by intermittently lowering the air-fuel ratio in the exhaust system.

Re claims 14-16, the regeneration controller of Harndorf et al. further comprises a difference detection unit for detecting at least one of an exhaust pressure difference and an exhaust temperature difference between an upstream side and a downstream side of the exhaust purification apparatus, in which the exhaust purification apparatus (115b) is a downstream side one of at least two exhaust purification apparatuses (115a, 115b) arranged in the exhaust system; wherein the mode change section determines whether to change the heating mode to the burn-up heating mode based on at least one of the exhaust pressure difference and the exhaust temperature difference detected by the pressure detection unit (see line 43 of column 6 to line 14 of column 7).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 17, 20; 24; and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harndorf et al. as applied to claims 14; 15; and 16, respectively, above, in view of Tashiro et al. (U.S. Patent 6,622,480).**

Re claims 17, 24, and 27, the regeneration controller of Harndorf et al. discloses the invention as cited above, however, fails to disclose that the mode change section increases the estimated accumulation amount and continues the burn-up heating mode when the exhaust

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pressure difference or the exhaust temperature difference detected by the difference detection unit is greater than a mode change reference value.

As shown in Figures 1 and 8, Tashiro et al. disclose a diesel particulate filter unit (4) and a regeneration control method of said unit. As indicated in step S15 of Figure 9, Tashiro et al. teach that it is conventional in the art to compute an incremental amount of particulate matter removed during a regeneration step of the filter unit and increase a total amount of removed particulate matter until a remaining amount is equal to a minimum value when such regeneration is deemed completed. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Tashiro et al. in the controller of Harndorf et al., since the use thereof would have been routinely practiced by those with ordinary skill in the art to effectively regenerate a particulate filter.

Re claim 20, in the modified regeneration controller of Harndorf et al., as taught by Tashiro et al., the mode change section limits the number of times for increasing the estimated accumulation amount to a reference number of times or less.

Allowable Subject Matter

6. Claims 18, 19, 21, 22, 25, 26, and 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Prior Art

7. The IDS (PTO-1449) filed on August 11, 2006 and October 24, 2007 have been considered. An initialized copy of each is attached hereto.

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8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of five patents: Kosaka et al. (U.S. Patent 6,959,541), Hiranuma et al. (U.S. Patent 7,013,638), Onodera et al. (U.S. Patent 7,043,903), Imai et al. (U.S. Patent 7,086,220), and Okugawa et al. (U.S. Patent 7,111,455) further disclose a state of the art.

Communication

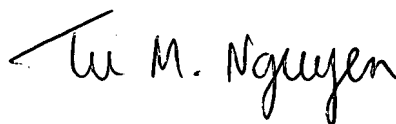
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMN

November 12, 2007



Tu M. Nguyen

Primary Examiner

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